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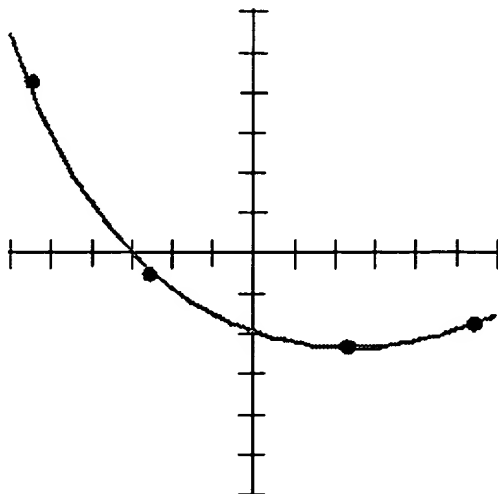
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spline

In computer graphics, a spline is a curve that connects two or more specific points, or that is defined by two or more points. The term can also refer to the mathematical equation that defines such a curve.

Consider the set of points in the illustration below. It is easy to envision a curve (red) that approximately connects the four points (blue). In the old days of mechanical drafting, a flexible metal or wooden strip (called a *spline*, and the term from which the present term derives) was used to construct approximate graphs such as this.



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A computer can be used to test various curves, having known formulas, for an optimal "fit" for any finite set of points. For example shown here, a near-perfect fit exists, and the curve has a relatively simple formula. Not all splines are this straightforward. But in theory, at least one spline curve can be found that approximates a continuous graph for any set of points.

Read more about it at:

- > [The Simpson College Math Department provides Electronic Resources for Splines.](#)
- > [Tim Lambert at the University of New South Wales, Australia, discusses Spline Curves.](#)

This word suggested by: Sally Carpenter

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SIMPSON COLLEGE

Mathematics Department

Math 385 - Senior Seminar - Electronic resources for Splines

The words "curve" and "spline" are, for all practical purposes, used interchangeably in computer graphics.

"A picture is worth a thousand words." These links run Java which is an interactive programming language, so be sure to interact. Drag points and watch the curves.

- Play with curves that were produced by [Lagrange interpolation](#).
- See how well cubic splines [approximate](#) a specific curve.
- See the [geometry](#) of a cubic spline curve.
- See how the [control points](#) control a Bezier curve.

Chebyshev Curves

- A [recursion formula](#) for Chebyshev polynomials
- [Recommendation](#) of a book by T. J. Rivlin
- A [connection](#) between Chebyshev polynomials and Pascal's triangle

Convex Hulls

- A [program](#) to caculate convex hulls

Maple files

- [Polynomial interpolation](#)
- [Bezier curves](#)

Aitken's method of interpolation

- A [biography](#) of Aitken

Quadrature Rules

- A [slide presentation](#) of quadrature rules
- [Examples](#) of numerical integration

References

- A [bibliography](#) of spline references.

Notes and lectures

- [Properties](#) of Bezier curves, some examples, and the c source code to produce them.
- [Properties](#) of spline curves, some examples, and the c source code to produce them.
- Some information about a [draftman's spline](#).
- Geometric modeling [notes](#) on many curve topics.
- [Outline](#) of a lecture on curves.
- Find a simple way to represent the [Bezier basis](#).
- [Lagrange polynomial](#) interpolation and its limitations. Even though this is an evaluated Mathematica document and you don't have Mathematica available to you, there is much information in this link. You can reproduce all these results with Maple.
- [Hermite curves](#). Again, this is an evaluated Mathematica document.

Projects

- A [project](#) for knot selection.

Writing

- On this page Annalisa Crannell gives advice for [writing in mathematics](#) .

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